

1) Rewrite $f(x) = 3(4)^{x-2} + 10$ in the form $y = a(b)^x + k$

2) Rewrite $f(x) = 6(2)^{x+5} - 4$ in the form $y = a(b)^x + k$.

3) Rewrite $f(x) = 2(4)^{3x+1} + 8$ in the form $y = a(b)^x + k$

4) Rewrite $f(x) = \frac{1}{2}(3)^{2x+4} - 6$ in the form $y = a(b)^x + k$.

5) $\left(\frac{125}{216}\right)^{-\frac{2}{3}}$

6) $\left(\frac{4c^{-5}b^6}{b^2d^{-3}}\right)^4$

7) $\left(\frac{32x^{10}b^{-3}}{b^2}\right)^{\frac{3}{5}}$

8) Write a function rule for the tables below.

x	-2	-1	0	1	2
y	$18\frac{1}{2}$			96	

x	-2	-1	0	1	2
y		$12\frac{4}{3}$		20	

9) Solve the following exponential equations.

$$\sqrt{3x+9} = 28$$

$$\sqrt{x-5} = \sqrt{2x+9}$$

$$(6x+10)^{\frac{3}{8}} = 8$$

$$(12-x)^{\frac{1}{4}} = 5$$

$$9(27)^{2x} = 81^{-4x}$$

$$125(5)^{-4x} = 25^{6x}$$

10) A radioactive element has a half life of 10 days. You have 25 grams of it. How many grams will you have left after 2 weeks?

11) A college anticipates that its tuition will increase 5.3% each year for the next 8 years. If the tuition is currently \$24,000, how much will it be in 8 years?

12) Ms. Smith would like to see our tardy attendances decrease by 8.5% every month. If there were 156 total tardy instances in September, how many do we anticipate in April?

$$\begin{aligned}
 1) f(x) &= 3(4)^{x-2} + 10 \\
 f(x) &= 3(4)^x(4)^{-2} + 10 \\
 f(x) &= 3(4)^x\left(\frac{1}{16}\right) + 10 \\
 \boxed{f(x) &= \frac{3}{16}(4)^x + 10}
 \end{aligned}$$

$$\begin{aligned}
 2) f(x) &= 6(2)^{x+5} - 4 \\
 &= 6(2)^x(2)^5 - 4 \\
 &= 6(2)^x(32) - 4 \\
 \boxed{f(x) &= 192(2)^x - 4}
 \end{aligned}$$

$$\begin{aligned}
 3) f(x) &= 2(4)^{3x+1} + 8 \\
 &= 2(4)^{3x}(4)^1 + 8 \\
 &= 8(4)^{3x} + 8 \\
 &= 8(4^3)^x + 8 \\
 \boxed{f(x) &= 8(64)^x + 8}
 \end{aligned}$$

$$\begin{aligned}
 4) f(x) &= \frac{1}{2}(3)^{2x+4} - 6 \\
 &= \frac{1}{2}(3)^{2x}(3)^4 - 6 \\
 &= 40\frac{1}{2}(3)^{2x} - 6 \\
 &= 40\frac{1}{2}(3^2)^x - 6 \\
 \boxed{f(x) &= 40\frac{1}{2}(9)^x - 6}
 \end{aligned}$$

$$5) \left(\frac{125}{216} \right)^{-2/3}$$

$$\left(\frac{216}{125} \right)^{2/3}$$

$$\left(\sqrt[3]{\frac{216}{125}} \right)^2$$

$$\boxed{\frac{36}{25}}$$

$$6) \left(\frac{4c^{-5}b^6}{b^2d^{-3}} \right)^4$$

$$\left(\frac{4b^4d^3}{c^5} \right)^4$$

$$\boxed{\frac{256b^{16}d^{12}}{c^{20}}}$$

$$7) \left(\frac{32x^{10}b^{-3}}{b^2} \right)^{\frac{3}{5}}$$

$$\left(\frac{32x^{10}}{b^5} \right)^{\frac{3}{5}}$$

$$\left(\sqrt[5]{\frac{32x^{10}}{b^5}} \right)^3$$

$$\left(\frac{2x^2}{b} \right)^3$$

$$\boxed{\frac{8x^6}{b^3}}$$

$$8) \begin{array}{c|c|c|c|c|c} x & -2 & -1 & 0 & 1 & 2 \\ \hline y & 187\frac{1}{2} & 150 & 120 & 96 & \end{array}$$

$$187\frac{1}{2}b^3 = 96$$

$$b^3 = \frac{96}{125}$$

$$b = \frac{4}{5}$$

$$\boxed{y = 120 \left(\frac{4}{5} \right)^x}$$

$$\begin{array}{c|c|c|c|c|c} x & -2 & -1 & 0 & 1 & 2 \\ \hline y & 10\frac{6}{25} & 12\frac{4}{3} & 16 & 20 & 25 \end{array}$$

$$12\frac{4}{3}b^2 = 20$$

$$b^2 = \frac{25}{16}$$

$$b = \frac{5}{4}$$

$$\boxed{y = 16 \left(\frac{5}{4} \right)^x}$$

$$9) \sqrt{3x+9}^2 = (28)^2$$

$$3x+9 = 784$$

$$x = 258\frac{1}{3}$$

$$(\sqrt{x-5})^2 = (\sqrt{2x+9})^2$$

$$x-5 = 2x+9$$

$$-x = 14$$

$$x = -14$$

$$((6x+10)^{\frac{2}{3}})^{\frac{3}{2}} = (8)^{\frac{3}{2}}$$

$$6x+10 = (\sqrt[3]{8})^3$$

$$6x+10 = 256$$

$$x = 41$$

$$((12-x)^4)^{\frac{1}{4}} = (5)^4$$

$$12-x = 625$$

$$x = -613$$

$$9(27)^{2x} = 81^{-4x}$$

$$3^2(3^3)^{2x} = (3^4)^{-4x}$$

$$3^2(3^{6x}) = 3^{-16x}$$

$$3^{2+6x} = 3^{-16x}$$

$$2+6x = -16x$$

$$x = -\frac{1}{11}$$

$$125(5)^{-4x} = 25^{6x}$$

$$5^3(5)^{-4x} = (5^2)^{6x}$$

$$5^{3-4x} = 5^{12x}$$

$$3-4x = 12x$$

$$x = \frac{3}{16}$$

10) Method 1:
half life is 10 days
14 days = 1.4 half-lives

$$y = 25\left(\frac{1}{2}\right)^{1.4}$$

$$y = 9.47g$$

Method 2:

x	y
0	25
10	12.5

$$25(b)^{10} = 12.5$$

$$b^{10} = \frac{1}{2}$$

$$b = 0.933 \leftarrow \text{change per day}$$

$$y = 25(0.933)^{14} \leftarrow \text{number days}$$

$$y = 9.47g$$

$$11) \frac{\$24,000(1.053)^8}{\$36,277.57}$$

$$12) 100\% - 8.5\% = 91.5\%$$

$$156(0.915)^7$$

approx 84 tardies